IN THE CLAIMS

Please amend the claims as follows:

Claim 1. (Currently Amended) An image forming apparatus, comprising:

at least one image carrier configured to carry toner images and pattern toner images thereon;

an endless transfer belt configured to one of directly and indirectly receive the toner images and the pattern toner images from the at least one image carrier, the transfer belt being spanned around a drive roller that drives the transfer belt to rotate and at least one driven roller; and

a position shift detector configured to detect positions of pattern toner images formed on the at least one image carrier,

wherein assuming that "N" is an integer equal to or greater than 1, pattern toner images are formed on the at least one image carrier at an interval of "1/N" of a circumferential length of the at least one image carrier, and the pattern toner images are transferred from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt, wherein the position shift detector detects positions of the pattern toner images to obtain position shift data, and wherein moving average values of "N" number of the position shift data are calculated, wherein the moving average values are calculated in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing.

Claim 2. (Currently Amended) An image forming apparatus, comprising:

at least one image carrier configured to carry toner images and pattern toner images thereon;

an endless transfer belt configured to one of directly and indirectly receive the toner images and the pattern toner images from the at least one image carrier, the transfer belt being spanned around a drive roller that drives the transfer belt to rotate and at least one driven roller; and

a position shift detector configured to detect positions of pattern toner images formed on the at least one image carrier,

wherein assuming that "M" is an integer equal to or greater than 1, pattern toner images are formed on the at least one image carrier at an interval of "1/M" of a circumferential length of a circle having a diameter equal to a length in which an average thickness of the transfer belt is added to a diameter of the drive roller, and the pattern toner images are transferred from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt, wherein the position shift detector detects positions of the pattern toner images to obtain position shift data, and wherein moving average values of "M" number of the position shift data are calculated, wherein the moving average values are calculated in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing.

Claim 3. (Currently Amended) An image forming apparatus, comprising:

at least one image carrier configured to carry toner images and pattern toner images thereon;

an endless transfer belt configured to one of directly and indirectly receive the toner images and the pattern toner images from the at least one image carrier, the transfer belt being spanned around a drive roller that drives the transfer belt to rotate and at least one driven roller; and

a position shift detector configured to detect positions of pattern toner images formed on the at least one image carrier,

wherein assuming that each of "N", "M", and "n" is an integer equal to or greater than 1, a ratio between a circumferential length of the at least one image carrier and a circumferential length of a circle having a diameter equal to a length in which an average thickness of the transfer belt is added to a diameter of the drive roller is set to "N:M", pattern toner images are formed on the at least one image carrier at an interval of "1/n X N" of the circumferential length of the at least one image carrier, and the pattern toner images are transferred from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt, wherein the position shift detector detects positions of the pattern toner images to obtain position shift data, and wherein first moving average values of "n X N" number of the position shift data are calculated, and then second moving average values of "n X M" number of the first moving average values are calculated, wherein at least one of the first and second moving average values is calculated in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing.

Claim 4. (Original) The image forming apparatus according to claim 1, wherein the moving average values of the "N" number of position shift data are calculated by a center average method.

Claim 5. (Original) The image forming apparatus according to claim 2, wherein the moving average values of the "M" number of position shift data are calculated by a center average method.

Claim 6. (Original) The image forming apparatus according to claim 3, wherein the first and second moving average values are calculated by a center average method.

Claim 7. (Original) The image forming apparatus according to claim 1, further comprising a control device configured to control a rotational speed of the drive roller based on the calculated moving average values to correct a speed variation of the transfer belt caused by an uneven thickness of the transfer belt in a circumferential direction of the transfer belt.

Claim 8. (Original) The image forming apparatus according to claim 2, further comprising a control device configured to control a rotational speed of the drive roller based on the calculated moving average values to correct a speed variation of the transfer belt caused by an uneven thickness of the transfer belt in a circumferential direction of the transfer belt.

Claim 9. (Original) The image forming apparatus according to claim 3, further comprising a control device configured to control a rotational speed of the drive roller based on the calculated second moving average values to correct a speed variation of the transfer belt caused by an uneven thickness of the transfer belt in a circumferential direction of the transfer belt.

Claim 10. (Original) The image forming apparatus according to claim 1, wherein the moving average values are calculated before a start of use of the transfer belt.

Claim 11. (Original) The image forming apparatus according to claim 2, wherein the moving average values are calculated before a start of use of the transfer belt.

Claim 12. (Original) The image forming apparatus according to claim 3, wherein the first and second moving average values are calculated before a start of use of the transfer belt.

Claim 13. (Original) The image forming apparatus according to claim 1, wherein the moving average values are calculated every time the number of image formations exceeds a predetermined number.

Claim 14. (Original) The image forming apparatus according to claim 2, wherein the moving average values are calculated every time the number of image formations exceeds a predetermined number.

Claim 15. (Original) The image forming apparatus according to claim 3, wherein the first and second moving average values are calculated every time the number of image formations exceeds a predetermined number.

Claim 16. (Currently Amended) A position shift detection and correction method for detecting and correcting a position shift in a color toner image formed on one of a transfer belt and a recording medium carried and conveyed on the transfer belt according to an uneven thickness of the transfer belt, comprises:

forming pattern toner images on at least one image carrier at an interval of "1/N" of a circumferential length of the at least one image carrier, where "N" is an integer equal to or greater than 1;

transferring the pattern toner images from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt;

detecting positions of the pattern toner images to obtain position shift data;

calculating moving average values of "N" number of the position shift data in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing; and

controlling a rotational speed of a drive roller that drives the transfer belt to rotate based on the calculated moving average values.

Claim 17. (Currently Amended) A position shift detection and correction method for detecting and correcting a position shift in a color toner image formed on one of a transfer belt and a recording medium carried and conveyed on the transfer belt according to an uneven thickness of the transfer belt, comprises:

forming pattern toner images on at least one image carrier at an interval of "1/M" of a circumferential length of a circle having a diameter equal to a length in which an average thickness of the transfer belt is added to a diameter of a drive roller that drives the transfer belt to rotate, where "M" is an integer equal to or greater than 1;

transferring the pattern toner images from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt; detecting positions of the pattern toner images to obtain position shift data;

calculating moving average values of "M" number of the position shift data in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing; and

controlling a rotational speed of the drive roller based on the calculated moving average values.

Claim 18. (Currently Amended) A position shift detection and correction method for detecting and correcting a position shift in a color toner image formed on one of a transfer belt and a recording medium carried and conveyed on the transfer belt according to an uneven thickness of the transfer belt, comprising:

setting a ratio between a circumferential length of at least one image carrier and a circumferential length of a circle having a diameter equal to a length in which an average thickness of the transfer belt is added to a diameter of a drive roller that drives the transfer belt to rotate to "N:M", where each of "N", "M" is an integer equal to or greater than 1;

forming pattern toner images on the at least one image carrier at an interval of "1/n X N" of the circumferential length of the at least one image carrier, where "n" is an integer equal to or greater than 1;

transferring the pattern toner images from the at least one image carrier onto the transfer belt over one cycle length of the transfer belt;

detecting positions of the pattern toner images to obtain position shift data;

calculating first moving average values of "n X N" number of the position shift data, and then calculating second moving average values of "n X M" number of the first moving average values, wherein at least one of the first and second moving average values is calculated in one cycle length of the transfer belt with elimination of a speed variation component of the image carrier by low pass processing; and

controlling a rotational speed of the drive roller based on the calculated second moving average values.

Claim 19. (Original) The position shift detection and correction method according to claim 16, wherein the calculating comprises calculating the moving average values of the "N" number of position shift data by a center average method.

Claim 20. (Original) The position shift detection and correction method according to claim 17, wherein the calculating comprises calculating the moving average values of the "M" number of position shift data by a center average method.

Claim 21. (Original) The position shift detection and correction method according to claim 18, wherein the calculating comprises calculating the first and second moving average values by a center average method.

Claim 22. (Original) The position shift detection and correction method according to claim 16, wherein the calculating comprises calculating the moving average values before a start of use of the transfer belt.

Claim 23. (Original) The position shift detection and correction method according to claim 17, wherein the calculating comprises calculating the moving average values before a start of use of the transfer belt.

Claim 24. (Original) The position shift detection and correction method according to claim 18, wherein the calculating comprises calculating the first and second moving average values before a start of use of the transfer belt.

Claim 25. (Original) The position shift detection and correction method according to claim 16, wherein the calculating comprises calculating the moving average values every time the number of image formations exceeds a predetermined number.

Claim 26. (Original) The position shift detection and correction method according to claim 17, wherein the calculating comprises calculating the moving average values every time the number of image formations exceeds a predetermined number.

Claim 27. (Original) The position shift detection and correction method according to claim 18, wherein the calculating comprises calculating the first and second moving average values every time the number of image formations exceeds a predetermined number.

Claim 28. (Currently Amended) An image forming apparatus, comprising:

image carrying means for carrying toner images and pattern toner images thereon;

image receiving means for one of directly and indirectly receiving the toner images and the pattern toner images from the image carrying means, the image receiving means being spanned around drive means for driving the image receiving means to rotate and driven means for being driven by a rotation of the image receiving means; and

position shift detecting means for detecting positions of pattern toner images formed on the image carrying means,

wherein assuming that "N" is an integer equal to or greater than 1, pattern toner images are formed on the image carrying means at an interval of "1/N" of a circumferential length of the image carrying means, and the pattern toner images are transferred from the image carrying means onto the image receiving means over one cycle length of the image receiving means, wherein the position shift detecting means detects positions of the pattern

toner images to obtain position shift data, and wherein moving average values of "N" number of the position shift data are calculated, wherein the moving average values are calculated in one cycle length of the image receiving means with elimination of a speed variation component of the image carrying means by low pass processing.

Claim 29. (Currently Amended) An image forming apparatus, comprising:

image carrying means for carrying toner images and pattern toner images thereon;

image receiving means for one of directly and indirectly receiving the toner images and the pattern toner images from the image carrying means, the image receiving means being spanned around drive means for driving the image receiving means to rotate and driven means for being driven by a rotation of the image receiving means; and

position shift detecting means for detecting positions of pattern toner images formed on the image carrying means,

wherein assuming that "M" is an integer equal to or greater than 1, pattern toner images are formed on the image carrying means at an interval of "1/M" of a circumferential length of a circle having a diameter equal to a length in which an average thickness of the image receiving means is added to a diameter of the drive means, and the pattern toner images are transferred from the image carrying means onto the image receiving means over one cycle length of the image receiving means, wherein the position shift detecting means detects positions of the pattern toner images to obtain position shift data, and wherein moving average values of "M" number of the position shift data are calculated, wherein the moving average values are calculated in one cycle length of the image receiving means with elimination of a speed variation component of the image carrying means by low pass processing.

Claim 30. (Currently Amended) An image forming apparatus, comprising:

image carrying means for carrying toner images and pattern toner images thereon;

image receiving means for one of directly and indirectly receiving the toner images and the pattern toner images from the image carrying means, the image receiving means being spanned around drive means for driving the image receiving means to rotate and driven means for being driven by a rotation of the image receiving means; and

position shift detecting means for detecting positions of pattern toner images formed on the image carrying means,

wherein assuming that each of "N", "M", and "n" is an integer equal to or greater than 1, a ratio between a circumferential length of the image carrying means and a circumferential length of a circle having a diameter equal to a length in which an average thickness of the image receiving means is added to a diameter of the drive means is set to "N:M", pattern toner images are formed on the image carrying means at an interval of "1/n X N" of the circumferential length of the image carrying means, and the pattern toner images are transferred from the image carrying means onto the image receiving means over one cycle length of the image receiving means, wherein the position shift detecting means detects positions of the pattern toner images to obtain position shift data, and wherein first moving average values of "n X N" number of the position shift data are calculated, and then second moving average values of "n X M" number of the first moving average values are calculated, wherein at least one of the first and second moving average values is calculated in one cycle length of the image receiving means with elimination of a speed variation component of the image carrying means by low pass processing.

Claim 31. (Original) The image forming apparatus according to claim 28, further comprising control means for controlling a rotational speed of the drive means based on the

calculated moving average values to correct a speed variation of the image receiving means caused by an uneven thickness of the image receiving means in a circumferential direction of the image receiving means.

Claim 32. (Original) The image forming apparatus according to claim 29, further comprising control means for controlling a rotational speed of the drive means based on the calculated moving average values to correct a speed variation of the image receiving means caused by an uneven thickness of the image receiving means in a circumferential direction of the image receiving means.

Claim 33. (Original) The image forming apparatus according to claim 30, further comprising control means for controlling a rotational speed of the drive means based on the calculated second moving average values to correct a speed variation of the image receiving means caused by an uneven thickness of the image receiving means in a circumferential direction of the image receiving means.